Running head: PHASED OPEN ACCESS IMPLEMENTATION

The Open Access Appointment System: A Phased Implementation Approach at Keller Army Community Hospital

A Graduate Management Project
Submitted to the Faculty of the U.S. Army-Baylor Program
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Abstract

Concerns about timely access to health care have driven many military health system (MHS) beneficiaries to question the way in which the MHS operates. The open access appointment system, based upon a methodology of *doing today's work today*, will allow Keller Army Community Hospital to address this core aspect of patient satisfaction. **Purpose**: The purpose of this study was to provide a framework for open access implementation within a small Army Community Hospital while concurrently examining the effect a phased implementation approach had on physician satisfaction, provider continuity, and appointment availability. **Methods**: This study is both a qualitative and quantitative, exploratory, descriptive, cross-sectional study of the requirements needed to implement an open access system and the effect a phased implementation has on clinical practices. **Results**: The requirements for implementing an open access system center around controlling appointing practices within the facility, effective template management, and effective space utilization. Mean levels of provider satisfaction increased and both provider continuity and appointment wait time improved at statistically significant rates ($p<.01$ for each). **Conclusions**: This study indicates that open access has benefited KACH, its staff members, and its beneficiary population.

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The Open Access Appointment System: A Transitional Model for the Military Health System

Introduction

The health care industry today is faced with numerous complex and unprecedented challenges. Backlash from the negative publicity that many health maintenance organizations received in the 1990s, coupled with growing consumerism in health care, caused many health care organizations to shift their organizational focus from a cost-containment methodology to one that was centered on patient satisfaction (Kilo, Horrigan, Godfrey, & Wasson, 2000). As health care organizations slowly began to adopt these more patient-centered business practices it was quickly seen that access to care was the most important element in determining patient satisfaction. However, most health care organizations were, and still are, operating with access systems based upon fee-for-service principles (Murray & Tantau, 2000).

Concerns about timely access to health care have driven many military health system (MHS) beneficiaries to question the way in which the MHS operates (Meyers, 2003). The MHS must address these concerns. The open access appointment system, based upon a methodology of *doing*

today's work today, will allow the MHS to address this core aspect of patient satisfaction.

This research project is designed to produce an implementation framework, evaluation criteria, and an overall assessment of the value that the open access appointment system brings to the Department of Primary Care at Keller Army Community Hospital (KACH), West Point, New York. This study first determines the overall requirements for implementing an open access appointment system at KACH. Included in this is a qualitative analysis of infrastructure, manpower, and operational resources. The aim of this study is to determine the requirements generated by adopting an open access appointing methodology; the impact implementation has on current clinical and business practices, and what clinical efficiencies are developed through a phased implementation of the system. The information provided in the research will enable the hospital leadership to decide if additional departments within the facility would benefit from open access appointment scheduling. A tertiary benefit of the research is providing the North Atlantic Regional Medical Command (NARMC) and the Army Medical Command (MEDCOM) a pilot study that both commands can use to ascertain the

feasibility of instituting the open access system at like-sized facilities.

Conditions that Prompted the Study

Griffith (1999) states that the ideal health care organization would be one that provides sound, comprehensive, and quality care to all of its patients at a cost affordable to its community. The ideal health care organization, in reality, does not exist in today's modern health care setting. This is due to the fundamental nature of the *iron triangle* of cost, quality, and access. Any attempt to change one corner of this triangle has a diametrical effect on the other two areas. However, if access is the sine-qua-non of quality, then it is possible to improve the quality of patient care by increasing or streamlining access to needed medical care within the health care organization.

Under KACH's current TRICARE managed care support contract, acuity level descriptions for appointment types drive how and when a patient is slotted for medical care within the facility. This method of appointing is an example of the traditional model that is widely recognized as the de-facto standard within health care organizations. The result has been an increase in the amount of patients

who are unable to see their regular primary care manager (PCM). A graphical representation of this is seen in Figure 1. As shown, KACH's average provider continuity rate is trending downward and the current fiscal year average is 51.99%.

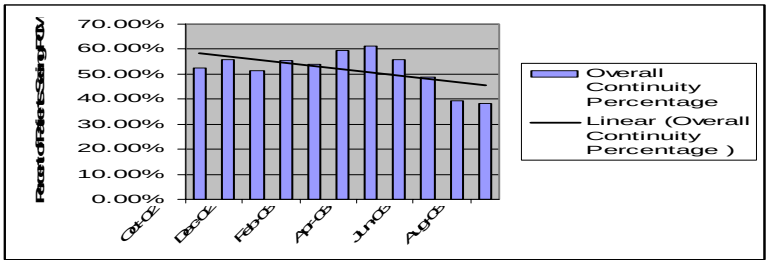

Figure 1. By month percentage of patients able to access their individual PCM for primary care visits at KACH.

Murray, Bodenheimer, Rittenhouse, and Grumbach (2003) indicate that a great source of beneficiary dissatisfaction with the health care system stems from a lack of provider continuity. Faced with the dilemma of seeing one's own primary care provider in two to three days or seeing a different provider today, many people choose the latter. Boelke, Boushon, and Isensee (2000) indicate that this often leads to disarticulate and lower quality care that ultimately results in higher medical costs due to increased follow-up appointments. Recognizing these factors, the NARMC Commander tasked each of the medical treatment facilities (MTFs) within the region to look at alternative access systems and their potential effectiveness within each organization. The open access appointment system is

KACH's attempt to implement a solution to an ongoing and growing problem within the MHS.

Statement of the Management Questions

This study asks two questions. The primary question is what is the required framework for successful implementation of an open access system? After determining the answer to that question, the study then seeks to answer the secondary question of; to what extent does a phased implementation effect physician satisfaction, appointment wait time, and provider continuity? A phased approach to open access implementation and the evaluation of its effectiveness will allow KACH senior leaders to validate implementation strategies and business practices. This will benefit not only primary care operations, but operations across all clinical areas of the hospital. As the MHS continues to transform into an increasingly outpatient and ambulatory care oriented health system, this open access pilot study has the potential to serve as a transitional model not only for NARMC and MEDCOM, but also for the entire military health system.

Literature Review

Background on Appointment Systems

The Traditional Model of Appointing: The traditional method of appointing is currently being used by over 75% of primary care practices in the United States and is characterized by saturated schedules coupled with a large demand for care (Murray & Tantau, 1999). This appointment system is designed around category descriptions of illness. Patients who call in to the physician's office for a same-day appointment compete against other patients for the appointment slot. Those deemed "less-sick" or who do not meet the strict definition of acute care are pushed back on the appointment list or bumped to another day. This leads to saturation of appointment schedules as those who cannot obtain a same-day appointment take the next available appointment. This leads to a lengthy inventory of acute and sub-acute appointments that slowly eliminate routine and wellness appointments from the physician's schedule (Meyers, 2003).

The willingness of providers to develop an inventory of scheduled appointments was based upon the fee-for-service reimbursement system that dominated health care up to the early 1990's. An appointment schedule that was fully

booked, often months in advance, ensured financial security for a provider. The more patients in the inventory, the more guaranteed income is generated for the provider. While providing financial security, the traditional model dramatically reduces the capacity for care within health care organizations. Schedules fill quickly and there is little room to see an acutely ill patient today. The large demand for care quickly fills any future appointments and prevents timely scheduling of any non-acute appointments (Murray & Tantau, 1999).

Quick saturation of appointments leads many individuals to bypass the primary care facility and instead seek care in urgent care clinics or emergency departments. Ulmer and Troxler (2002) indicate that this ultimately leads to increased health care costs and consumer dissatisfaction. The unique factor that is common among all these areas is that the traditional model is provider-driven and physician centered. It doesn’t account for the reality of the consumer’s daily schedule and only serves to maximize the revenue potential of the physician (Kilo, Horrigan, Godfrey, & Wasson, 2000). Increasing dissatisfaction with the traditional model and the evolution of the managed care industry in the early 1990’s

spurred the development of a new access system, the carve-out model.

The Carve-Out Model: The carve-out system was developed around the premise that demand for health care was predictable. This concept was at odds with the fee-for-service belief that demand was finite and potentially scarce and the managed care belief that demand was insatiable. While polar opposites, the central tenet around each belief is that demand is unpredictable (Murray & Tantau, 1999). Kilo, Triffletti, Tantau, and Murray (2000) indicate, that health care is a service industry and as such must follow the premise that demand is predictable.

Smoller (1995) indicated that health care organizations could systematically account for daily and seasonal variations in demand for service and adjust staffing and resources to cover the anticipated demand. Based on this, health care organizations began to *carve-out* acute appointments based on the predicted demand. Seeing the utility of this model, the MHS and Keller Army Community Hospital have adopted the carve-out system for primary care appointing. While a drastic improvement in terms of access and patient satisfaction over the traditional model, the carve-out model falls short of true

patient-centered access in a number of areas. As seen in the traditional model, the carve-out model continues to deflect patients to alternative care sites once the provider's schedule becomes saturated. The difference between the models is that in the carve-out model this usually happens later in the day thereby reducing, but not eliminating, increased costs and consumer dissatisfaction due to the inability to get a timely appointment (Murray & Tantau, 1999). An additional shortcoming in the carve-out model is that it often times fails to match the patient to their primary care provider. The primary concern is booking patients into available appointment slots and if possible matching that to a unique provider. However, filling the available appointment always takes precedence over provider preference.

Many issues unique to the carve-out model have also been found that detract to its overall effectiveness. The first of these issues is demand management. The constant struggle to balance the appropriate number of acute and routine appointments within a facility has proven to be an impossible mission. Patients that are knowledgeable of the appointment system often misrepresent their condition to gain access to a provider, subverting the appointment

system and placing other patients at risk. This leads into the second unique issue of the carve-out model: multiple appointment types (Norbut, 2003).

Often a patient's medical condition does not easily fit into a definition of acute or routine. In order to meet the demand for health care that arises from these sub-acute patients, many health care organizations develop intermediate appointment types. These appointments are for those patients too ill to wait for a routine appointment yet not ill enough to bump their way into an acute appointment or who are unwilling to accept an offered appointment for the day they call. When this happens in a carve-out system extensive time and effort is expended in trying to "fit" a patient into a category. This not only leads to patient frustration but to staff and provider frustration as well. It also decreases both patient and provider satisfaction with the health care system. As access to acute appointments becomes more limited due to multiple appointment types occupying future appointment slots, the carve-out model ceases to provide functional utility over the traditional model (Murray & Tantau, 2000). Carve-out models quickly succumb to the same constraints as

traditional models and their failure is just as predictable.

The Open Access System: Based upon the premise that all of today's work can be done today, Dr. Mark Murray and Ms. Catherine Tantau developed a second-generation appointment system they termed open access. Applying the tenet of predictable demand, Murray and Tantau (2000) found that the demand for all types of health care within an organization could be accurately predicted. They then found that between 75-80% of patients needing an appointment would rather be seen on the day that they call with the remainder seeking care the following day. These two principles are the cornerstones of the open access system. By knowing historical demand for care and the percentage of patients who will want to be seen on the day they call, it is simple to develop an accurate demand projection for any given day (Meyers, 2003). In this nontraditional appointment process only two appointment types exist, those that will occur today and those that will occur other than today.

The open access system shows many benefits over the traditional and carve-out systems. The first benefit of the open access system is that it creates capacity. The

traditional and carve-out models were shown to reduce capacity as acute appointment slots continually reduce the amount of routine or wellness appointments available on any given day. This prevented providers from expanding appointments or creating new capacity. By eliminating appointment types, the open access system allows a provider to do today's work today in lieu of putting it off into the future. This in turn allows the provider to expand or contract capacity to meet demand, a luxury not available under the carve-out or traditional models (Asher, 1997).

The second benefit of the open access system is that it matches patient to provider. In doing today's work today, providers free themselves to see their patients when they want to be seen. Deflections to other providers only occur when the patient's primary care provider is out of the office. This leads to the third benefit of the open access system, a reduction in the amount of held appointments. Under the open access system approximately 20-25% of appointments are held for future booking. These appointments are held to meet the patient's needs, either from preference or clinical necessity (Murray & Tantau, 1999).

The final benefit of the open access system is an increase in both patient and provider satisfaction with the delivery of health care. Andrews and Croes (1999) indicate that open access systems increase a patient's access to their specific primary care provider, thus increasing their level of satisfaction with the care provided. Primary care providers were also shown to have increased levels of satisfaction under an open access system. This was attributed to developing a more personal relationship with their patients, having a more stable and predictable schedule, and having the ability to more accurately diagnose and treat their patient's illness (Carlson, 2002). While the open access system has many advantages over the traditional and carve-out models it is not easily implemented. Barriers to effective use of the system are numerous and overcoming those barriers takes a defined systematic approach.

Requirements for Successful Implementation

Droste (1999) delineates four steps that organizations need to take to ensure successful implementation of an open access appointment system. The first of these steps is working down the backlog of appointments. Under both traditional and carve-out systems a tremendous backlog of

appointments develops over time. In order to implement an open access system that does today's work today, backlog must be eliminated and future appointments made available. The second step is to set an appropriate panel size for each provider and estimate demand. This will vary from one organization to another but an appropriate panel size will eliminate unnecessary backlog that will cripple an otherwise effective system. An appropriate panel size coupled with an accurate estimate of demand ensures that capacity is available and today's work will be done today. The third step is development of the appropriate infrastructure. Kolata (2001) indicates that a robust phone system and staffing mix is necessary to ensure success of the system. The last step is to ensure organizational leader and physician buy-in to the system. Jacob (2001) states that the greatest barrier to successful implementation of an open access system is lack of physician support. The open access system is not an intuitive one and runs counter to the way appointing has traditionally been done in both the civilian and military setting. It removes many of the barriers that have been thought necessary to ensure equity of access among beneficiaries and by doing so raises skepticism among many

physicians. A full commitment to the system must be driven from the top down to ensure full and unequivocal support from the physicians within the organization (Meyers, 2003). The open access system provides a method to improve patient satisfaction, provider satisfaction, and streamline the provision of care within the MHS.

Keller Army Community Hospital's Approach Towards Implementation

KACH seeks to implement the Open Access system with a three-Phased approach consisting of short-term (Phase I: 1-2 months), mid-term (Phase II: 2-6 months), and long-term (Phase III: over 6 months) goals and requirements. In Phase I the primary care department will (1) modify its appointment templates to increase it's number of acute appointments and (2) develop internal primary care manager (PCM) teams within the department and CHCS. These initiatives have three purposes, the first of which is to reduce the amount of backlog each provider has within his or her panel. The priority for backlog reduction is acute, routine, and wellness appointments. The secondary purpose is to gradually improve provider continuity by increasing patient access to their assigned PCM. In conjunction with this, the development of PCM teams is critical as it

provides flexibility to appoint patients when the PCM is unavailable and provides seamless patient care support in the event of staffing shortfalls.

Phase II requirements consist of two focus areas: (1) bringing primary care appointing back to KACH (not evaluated due to time constraints) and (2) education of beneficiaries on the new system. The Phase III requirement is to adjust PCM empanelment based on historical demand.

Statement of Purpose

The primary purpose of this study is to provide a qualitative analysis of the requirements generated in developing a phased approach to open access implementation. This study also has a secondary purpose of determining what effect, if any, phased implementation of open access had on the dependent variables of (a) provider satisfaction, (b) average wait time for appointments, and (c) provider continuity. Physician satisfaction is defined as an overall feeling of contentment or satisfaction physicians have for the various aspects of their professional practice (Vancosky, 1998). Average wait time for appointments is defined as the average number of days a patient would have to wait to access a provider’s third available appointment. This measure is used to eliminate the triage appointing

bias inherent in the carve out system currently in place at KACH. Provider continuity is defined as the percentage of patients who see their empanelled primary care provider during a scheduled appointment.

The independent variable for the secondary goal of the study is Phase I of the open access implementation. In this study Phase I is defined as appointment template modification to the open access variant and PCM team development. Phases II and III are not evaluated due to time constraints for submission of this thesis.

To fully evaluate the effect that phased implementation of an open access system has on clinical and business operations the following three null and alternate hypotheses are proposed:

1. H_0= There is no difference in physician satisfaction post Phase I implementation when compared to the current pre-implementation satisfaction rates.

H_α= There is a difference in physician satisfaction post Phase I implementation when compared to the current pre-implementation satisfaction rates.

2. H_0= There is no difference in the average wait time for an appointment post Phase I implementation.

H_{α}= There is a difference in average wait time for an appointment post Phase I implementation.

3. H_{0}= There is no difference in primary care provider continuity post Phase I implementation.

H_{α}= There is a difference in primary care provider continuity post Phase I implementation.

These measures are used for two reasons. First, all indicated dependent variables are easily collected and quantifiable. Secondly, they were determined to be a significant indicator of the primary care department's ability to meet various patient appointment needs and were key focus areas that the Chief of Primary Care directed to be analyzed during the course of this study.

Methods and Procedures

Study Design

This study is a qualitative, exploratory, descriptive, cross-sectional study of the requirements needed to implement an open access system. It is descriptive in nature as it is designed to determine the who, what, where, when, and how much of a particular variable exists (Cooper & Schindler, 2001). A cross-sectional design was chosen for the study, as comparison of variables throughout

implementation Phases is of greatest interest. Since there is a lack of data on the requirements needed to implement an open access system within the MHS, and few MTFs have implemented any form of alternative appointment systems, the study is exploratory in nature. It is fully expected and desired that this research be the catalyst for future more detailed studies on open access within KACH and the MHS.

Assumptions: There are two key assumptions that are relevant for this open access study: (1) MEDCOM, NARMC, and/or the TRICARE Management Agency (TMA) will provide Keller Army Community Hospital with enough funding to establish an infrastructure capable of meeting the necessary requirements to implement an open access system and (2) pending funding, appropriate support staff will be hired to meet minimal projected staffing requirements.

If the above mention manpower and funding constraints are not overcome in a timely manner, the analysis this study seeks to provide will not be negatively affected. They are listed here as potential constraints to full implementation of an open access system.

Data Sources

The data source used for the primary or qualitative portion of this study is the collective experience of KACH's senior leadership and staff members. There are two primary data sources for the secondary or quantitative portion of the study. The first data source is KACH's Composite Health Care System (CHCS) database. This database, through the standard reports and ad-hoc query capacity, will provide monthly data on the dependent variables of interest. These variables are noted as b-c in the statement of purpose discussed above. Raw data consisting of total appointments by provider and third-available appointment time will be collected prior to the implementation of each phase to establish a baseline. Data will then be collected monthly and differences in the baseline data and phase implementation data will be analyzed through statistical analysis to determine significance. This analysis will aid in ascertaining the efficacy of each implementation Phase on improving provider continuity and average appointment wait time in the Primary Care Department of Keller Army Community Hospital.

The second data source is a physician satisfaction survey created for use within this study (see Appendix A).

The physician satisfaction survey is a 16-item questionnaire that was adapted from a 27-item questionnaire used by Vancosky (1998). The changes from the Vancosky questionnaire were the elimination of questions 12-19, 23, 25, and 27. These questions were eliminated as they had limited applicability to the primary care department or providers. A five point Likert scale (1=Never Satisfied, 2=Sometimes Satisfied, 3=Usually Satisfied, 4=Satisfied Most of the Time, and 5=Always Satisfied) is used to quantify responses. The 16 questions were sorted into four multi-item satisfaction subscales. Questions 1-4 were indicative of satisfaction with global healthcare facets. Questions 5-7 were indicative of satisfaction with the quality of care administered to patients. Questions 8-11 were indicative of satisfaction with the continuity of practice within the primary care department. Questions 13-14 were indicative of satisfaction the amount of personal time the provider had available. Questions 12, 15, &16 were stand-alone questions that were measured as single item facets. A means comparison was used to analyze the results and ascertain the efficacy of the open access system on increasing provider satisfaction.

Sampling Technique

The population for this study is all of the primary care providers employed at KACH. A self-administered questionnaire was distributed to all of the primary care providers assigned to KACH on October 31, 2003. The clinical assignment and names of all primary care providers was cross-validated by both the Chief of Personnel and the Deputy Commander for Clinical Services to ensure that each primary care provider was properly identified for inclusion in the study. Data collected for this study was obtained from all primary care providers who returned completed questionnaires. Providers who were not on the active work force rolls on the October 31, 2003 implementation date were not included in the study.

The entire questionnaire data collected in this study was reported in a simple report card format. Appendix B includes a sample of this format. This format was chosen for its simplicity and use in prior studies by Vancosky (1998) and the Office of the Assistant Secretary of Defense for Health Affairs. The report card format elegantly captures the means comparison between the two questionnaires and graphically depicts the overall level of satisfaction within the Primary Care Department.

Questionnaire Data Collection

The satisfaction questionnaire was submitted to the primary care providers on November 3, 2003 and then again on March 2, 2004. Each questionnaire consisted of the question sheet with detailed guidance on how to complete the questionnaire, a return envelope, and a letter signed by the Deputy Commander for Administration encouraging participation in study. Including in the instructions was a request to have the questionnaire completed and returned within two weeks.

All surveys were returned within a three-week time frame and upon receipt were reviewed to ensure they were completed accurately. Upon verification that the survey met completion guidelines, the data was input into a Statistical Package for Social Sciences© (SPSS©) computerized database for statistical analysis. To ensure accuracy in data input, a disinterested third-party verified no data entry errors were made in the data entry process. An ANOVA was then used to compare the baseline and Phase I survey to determine if the differences between the means of each question were statistically significant. This analysis is used to determine what effect implementing Phase I had on provider satisfaction.

Validity and Reliability

A key component to any research is addressing the validity and reliability of results obtained. Reliability accounts for the accuracy of the procedures used to measure data and validity determines whether the study design actually measures what it is attempting to measure (Cooper & Schindler, 2001). Gliem and Gliem (2003) indicate that the closer Cronbach's Alpha is to 1.0, the greater the internal consistency of a survey or questionnaire's construct items. The provider satisfaction survey used in this study was determined to be reliable and valid in both content and construct with a Cronbach's Alpha of .86 which exceed the threshold of .80 that is generally accepted as the default standard for reliability (Gliem & Gliem). Content validity was established through a physician review of the modified survey. The review panel was responsible for ensuring that all 16 questions represented an accurate and applicable measurement for defining primary care provider satisfaction within KACH.

The provider continuity and appointment availability dependent variable raw data is computer generated. The reliability of this data is expected to be high as data quality entry for KACH is currently at over 98%. TMA and

MEDCOM have also approved CHCS raw data as being reliable and valid for use in their independent studies.

Ethical Considerations

To ensure the validity of the responses generated in the provider questionnaire, all participants were assured in writing that their responses would be kept confidential. The method used to collect the data also ensured the anonymity of the respondents. No biographical data was collected on the respondents and allowing them to return their surveys via self-addressed envelopes protected them from identification, a key concern in a small medical treatment facility. Additionally, once the survey data was input into SPSS© and validated, the original survey forms were destroyed via crosscut shredding to eliminate the possibility of identifying a provider through their hand-written comments.

Qualitative Findings and Results

Administrative Findings: Appointment Center Operations

The implementation of an open access system does not occur in a vacuum and the process of implementation crosses both clinical and administrative boundaries. In recognition of this, KACH convened a multidisciplinary action team to develop the resource requirements for implementing an open

access system. This team met a total of four times for a total of approximately 3.5 hours. The end state was the generation of a requirements list that delineated the needed resources and the projected cost for each of the items. This list is shown in Table 1 below.

The key finding of the action team centered on the need for KACH to divest itself from the centralized appointment system established by the Managed Care Support Contractor (MCSC) and implement a local solution that would be more responsive to the needs of the facility. In effect, Phase II implementation, and the requirements generated by implementing an appointment center, was seen as one of the key qualitative success factors in establishing an effective open access system.

Table 1. Appointment Center Resource Requirements

Infrastructure/Infrastructure Upgrades	**1100 sq/ft**	**$26,900**
Personnel	**9 (5x FT/ 4x PT)**	**$83,496**
Furniture	**5 x Workstations**	**$95,000**
Computer Systems	**6 x Computers/Printers**	**$14,000**
Automated Call System (ACS)	**1 x ACD System**	**$10,760**
ACS Connectivity Upgrades	**2 x Connection Cards**	**$7,500**
Digital Phone Systems	**7 x Phone Systems**	**$1,600**
Total		**$239,256**

The ability of a military medical treatment facility to change current appointing practices and develop an appointment center is fraught with many regulatory and

contractual hindrances. In most cases if the Managed Care Support Contractor controls the appointing function, as in the case of KACH, they will often refuse to allow the MTF to recapture that service or will place undue financial requirements on the MTF that makes recapture unfeasible. Keller Army Community Hospital has avoided this pitfall through the fortuitous occurrence of having the current managed care support contract transition to a new contractor. The new contract, which goes into effect on September 1, 2004, gives the requirement for all appointment services back to the MTF's. This change to current practices has been the impetus behind KACH's push towards open access. The ability to control the appointment function, deemed critical by not only the open access action team but by Murray and Tantau (2000) as well, will allow KACH to seamlessly transition into Phase II of open access implementation within the facility.

Clinical Findings: Template Management & Space Constraints

As previously stated, transition to an open access system does not occur in a vacuum. In addition to the qualitative administrative findings, several observations effecting clinical practices were noted. The primary clinical focus area was the transition of the primary care

provider's appointment schedules. The system in place prior to execution of Phase I was inefficient and lacked a patient-centered focus. Provider templates, developed under the carve-out methodology, were heavy on acute appointments to the detriment of routine and wellness appointments. While no data was being captured to quantify this result, hence the qualitative analysis, discussion with the providers indicated that they perceived that the day-to-day appointment demand, as classified by acute, routine, and wellness, did not match the set appointment template.

The second area of clinical concern was space utilization. Current MEDCOM primary care optimization guidelines indicate that the optimal facility layout will include one office and two exam rooms per provider (1x2). This matches the current findings of Pinto, Parente, and Barber (2002) that indicates that the optimal primary care office operating under the open access system will consist of the 1x2 configuration. Keller Army Community Hospital is constrained in this area. Primary care providers are currently operating in a 1x1 or 1x2 configuration. Limitations on effectiveness of open access under this configuration will be discussed below.

Quantitative Findings

Physician Satisfaction

A total of 22 satisfaction questionnaires were provided to the Department of Primary Care. Eleven providers were each provided the survey, once prior to Phase I implementation and one post Phase I implementation. The response rate for the questionnaires was 100% with 22 being returned within three weeks of distribution.

A 5-point Likert Scale (1=Never Satisfied and 5=Always Satisfied) was used to determine the satisfaction level of the primary care providers at KACH. Prior to Phase I implementation (NOV 03), primary care providers were most satisfied with (1) the ability to practice according to their best judgment, (2) their overall professional practice, and (3) the quality of care they were able to provide. They were least satisfied with (1) the amount of time spent practicing outside their specialty, (2) continuity of patient care, and (3) the efficiency with which they are able to practice in the facility.

Post Phase I implementation (MAR 04) they were most satisfied with (1) the ability to practice according to their best judgment, (2) the quality of care they were able to provide, and (3) their overall professional practice.

They were least satisfied with (1) the amount of time spent practicing outside their specialty, (2) the number of exam

Table 2. Mean Scores and Standard Deviation of Highest and Lowest Rated Areas

Question # Pre-Phase I	N	Mean	SD
Highest Rated Areas			
Your ability to practice according to your best judgment? (Q6)	11	4.182	1.079
Your overall professional practice? (Q1)	11	4.000	0.447
Quality of care you are able to provide? (Q5)	11	4.000	0.894
Potential to achieve your professional goals? (Q4)	11	3.818	0.874
Lowest Rated Areas			
Amount of time you spend practicing outside your specialty? (Q16)	11	2.909	0.701
Continuity of patient care you area able to provide? (Q11)	11	2.909	1.044
The efficiency with which you are able to practice in your facility?	11	3.000	0.775
Number of examination rooms available? (Q10)	11	3.000	1.265
Question # Post-Phase I	**N**	**Mean**	**SD**
Highest Rated Areas			
Your ability to practice according to your best judgment? (Q6)	11	4.455	0.688
Quality of care you are able to provide? (Q5)	11	4.273	0.647
Your overall professional practice? (Q1)	11	4.000	0.447
Extent to which your current practice has met your expectations? (Q3	11	4.000	0.632
Lowest Rated Areas			
Amount of time you spend practicing outside your specialty? (Q16)	11	2.909	0.701
Number of examination rooms available? (Q10)	11	3.000	1.265
Your ability to help form policies within your facility? (Q15)	11	3.182	0.751
The efficiency with which you are able to practice in your facility?	11	3.364	0.674
Continuity of patient care you area able to provide? (Q11)	11	3.364	0.674
The non-salary benefits of being a military officer? (Q12)	11	3.364	0.674
Amount of time you have for your family and your personal life? (Q13	11	3.364	0.924

rooms available, and (3) the ability to form policies within the organization. Table 2 below summarizes the mean and standard deviations for the highest and lowest rated areas pre and post Phase I. Refer to Appendix D for a complete listing of mean scores and standard deviation of all 16 items in the questionnaire.

A means comparison was used to analyze the individual item responses from both surveys. The statistic used was

analysis of variance (ANOVA), which utilizes an F-ratio for the test of statistical significance. Appendix B contains the results of the ANOVA and the F-ratio and significance each survey item. It is interesting to note that the difference in responses between the surveys was not statistically significant for any item. Therefore while it can be said that the mean for individual item responses increased in some cases, the increase cannot be statistically attributed to the open access protocols but instead must be attributed to both the implementation of Phase I activities as well as random chance. In this case, as predicated by the study design, the alternate hypothesis is rejected and the null hypothesis is accepted. There is no difference in physician satisfaction post Phase I implementation when compared to the current pre-implementation satisfaction rates,.

In addition to the Likert-Scale responses, primary care providers were invited to include written comments on their survey forms to allow them to make any comments that they felt were pertinent to their satisfaction level within the organization. No comments were received on the first survey; however, many comments were included in the second survey. Interestingly, although over 91% of all providers

considered themselves “Always Satisfied” or “Satisfied Most of the Time” with their overall professional practice (Q1), the majority of the comments included on the second questionnaire were negative. While unable to quantify written comments, it is noted that the majority of the negative comments centered on continuity of care and space utilization, issues that are germane to the topic of open access. Appendix E includes the full listing of all written comments received.

Physician Continuity

Physician continuity data was captured from October 2002 through March 2004. The data was captured in a percentage format indicating the percent of patients that providers saw that were currently empanelled to them through the managed care support contractor. The continuity percentages were analyzed through the use of ANOVA. This analysis was chosen due to the fact that the percentages could be compared both pre and post Phase I. The analysis resulted in an F-ratio of 24.626 with the critical values for F(1,197) at 3.912 (alpha at the .05 level) and 6.831 (alpha at the .01 level). The F-ratio exceeds the 3.912 value needed for statistical significance at the $p<.05$ level and exceeds the 6.831 value need for statistical

significance at the $p<.01$ level. Therefore, it can be determined with 99% confidence that changes seen in provider continuity after the implementation of Phase I open access system were not due to random chance but to the protocols themselves. The full results are shown in Appendix F.

After determination of statistical significance, a Pearson Correlation (r) was conducted in order to analyze the magnitude and direction of the change that Phase I implementation had on provider continuity. The full results are shown in Appendix F. The analysis resulted in an r-value of .334 and a 2-tailed significance of $1.51x10^{-6}$. The r-value indicates that there is a positive linear relationship between provider continuity rates and Phase I implementation. The above two analyses indicated that there is a statistically significant relationship between provider continuity and Phase I implementation. Therefore the null hypothesis is rejected and the alternate hypothesis; there is a difference in primary care provider continuity post Phase I implementation, is accepted.

Average Wait Time for Appointments

Third available appointment data was collected from January 2003 through March 2004. The data was captured as

the number of days until a provider's third available appointment. These values were then averaged to get the primary care department's third available appointment. The data was then analyzed through the use of ANOVA. This analysis was chosen due to the fact that the data could be compared both pre and post Phase I. The analysis resulted in an F-ratio of 22.806 with the critical values for F(1,59) at 4.004 (alpha at the .05 level) and 7.085 (alpha at the .01 level). The F-ratio exceeds the 4.004 value needed for statistical significance at the $p<.05$ level and exceeds the 7.085 value need for statistical significance at the $p<.01$ level. Therefore, it can be determined with 99% confidence that changes seen in the third available appointment time were not due to random chance but to implementation of Phase I protocols. The full results are shown in Appendix G.

After determination of statistical significance, a Pearson Correlation (r) was conducted in order to analyze the magnitude and direction of the change that Phase I implementation had on third available appointment days. The full results are shown in Appendix G. The analysis resulted in an r-value of -.531 and a 2-tailed significance of 1.258×10^{-5}. The r-value indicates that there is a negative

linear relationship between third available appointment days and Phase I implementation. The above two analyses indicated that there is a statistically significant relationship between third available appointments and Phase I implementation. The null hypothesis is rejected and the alternate hypothesis; there is a difference in third available appointment dates post Phase I implementation, is accepted.

Discussion

The intent of this study was to provide the command group of Keller Army Community Hospital an outline of the key qualitative and quantitative factors that have been discovered as the hospital slowly moves toward a full open access appointment system. The need for this information is critical at this time as KACH is posturing itself for transition to the next generation of TRICARE contracts. The information gathered and presented in the study will be used by the command to make well-informed decisions about the strategic direction that KACH will take, not only in appointment methodologies but also in management strategies as a whole. While KACH is a military medical treatment facility, which makes it significantly different from a civilian for-profit or not-for-profit hospital, the

underlying management principles are the same: providing timely access to high quality healthcare at an affordable cost is the key to success in the healthcare industry. The move toward an open access system is KACH's attempt to meet these goals now and in the future.

Qualitative Impacts

As mentioned in the introduction, one of the goals of this study was to provide a qualitative analysis and a framework for implementing an open access system. The basis of the findings were detailed in the qualitative results section covered previously. While certainly not all encompassing, the factors discussed are the true drivers of success in fully implementing an open access system. In order for KACH to be successful in an open access system, it must control the appointing process. KACH has postured itself to gain this functionality on September 1, 2004 when the transition to the new MCSC takes place. However, two additional factors not discussed as resource requirements in developing an appointment center are key. The first of these is that the personnel detailed to work the appointment center need to be contract employees. While a discussion of the merits of government service employees vs. contract employees is beyond the scope of this study,

the action team found the flexibility to add or reduce personnel in the appointment center to be key to the overall financial success of the hospital.

A second factor that was instrumental in the development of the appointment center requirements was space utilization. Keller Army Community Hospital, like many MTFs, has limited space to expand operations of any type. The addition of an appointment center to the hospital's footprint was an unplanned event. As no space existed within the facility to house the appointment center, space was carved out of a satellite building located off campus. While not the optimal location, the space was found to be adequate and the financial resources were committed to upgrading the building to meet the needed requirements. It is recommended that any facility that seeks to undertake an open access system fully explore the space utilization requirements needed prior to committing to the program.

The second qualitative area that was discussed in the results section revolved around clinical efficiencies. As noted, the current exam room and provider office footprint is inadequate under the optimized design model. This was noted prior to conducting this study and was seen as a key

area of concern. In order to address this concern while concurrently moving forward on the open access project, KACH invited two groups of United States Military Academy cadets majoring in operational and systems research to study this problem. The two groups completed their preliminary analysis in December 2003 and currently a follow-on group of cadets is conducting an additional analysis on the Primary Care Department. Their recommendations are due to be presented to the commander in May 2004. If any of the recommended efficiency solutions is accepted a follow on study will be conducted to see how it might impact the open access system. The key recommendation from this area is that concurrent study of all impact areas must be conducted to ensure success of an open access system. Keller Army Community Hospital did not have the time or resources to conduct sequential studies of all areas impacted by open access. Therefore the decision was made early in the project development cycle to maximize the resources available at West Point and conduct parallel analysis on key areas. This has postured the command to make well-informed decisions on the scope and direction that KACH’s open access system will take.

Quantitative Factors

The results of the quantitative analysis on Phase I implementation has been presented above. I will discuss each area: provider satisfaction, provider continuity, and appointment availability, in turn.

The study of provider satisfaction was conducted in order to ascertain if the physicians were committing themselves to the concept of open access. In essence, the provider satisfaction survey was used as a proxy for corporate buy-in to the open access project. While publicly professing support for the program, many of the providers, when discussing the issue privately, questioned the effectiveness of such a program in the MHS. The lack of support staff and exam space was the key concern, with many providers echoing the sentiment that the MHS is not a for-profit civilian organization. This area still remains nebulous after quantitative analysis. With no question item having a statistically significant difference when the two surveys were compared, it is impossible to ascertain whether or not the providers are embracing or rejecting the system. However increases in the means of Questions 7 (efficiency), 8 (time spent with patient), and 11 (continuity of care) are positive indicators that the

implementation of Phase I processes has had a positive effect on both provider satisfaction and possibly clinical outcomes. In its study, the Institute for Healthcare Improvement (2003) indicates that open access leads to more satisfied providers and increased clinical outcomes. With just the initial implementation of an open access process, it seems that KACH is benefiting from those predicted results. It is recommended that further study on clinical outcomes and provider satisfaction be conducted as the open access system is fully implemented to ascertain if the noted increases in the above areas are sustainable over time.

Provider continuity has been shown to be instrumental in not only improving clinical outcomes for patients, but also for maximizing revenue within a healthcare organization. This premise is founded on the belief that if providers spend more time with their patients a mutually synergistic rapport will develop in which the patient and provider freely share information. This in turn allows the provider to become fully knowledgeable about the patient and in turn make more complex diagnoses which leads to higher revenue generation (Schneck, 2001). While not profit driven, the MHS is still driven to increase clinical

outcomes and maximize workload per provider. Increasing provider continuity through open access is one way that MTFs can accomplish this goal.

As seen in the above results, Phase I implementation was shown to have a statistically significant impact on provider continuity. This correlates nicely with the findings in the provider satisfaction survey that showed the mean score of Question 11 (continuity of care) rising from 2.919 to 3.364. This correlation supports the argument that open access is beneficial for KACH and the serviced population.

Ultimately, the goal of open access is to improve access to care for serviced beneficiaries. The preceding analysis, while beneficial from an educational standpoint, is meaningless unless an actual increase in access to care is seen under the open access system. The results of appointment wait time indicate that that the open access system, as implemented at KACH, has improved access to care. As shown above, the number of days until a provider’s third available appointment dropped from a mean of 3.69 to 3.11. This indicates that access is improving as open access procedures are slowly starting to shape the demand for appointments within the facility. It is expected that

third available appointment days will continue to drop as Phase II and III are implemented.

Recommendations and Conclusion

This study provided a qualitative analysis of the requirements generated in developing a phased approach to open access implementation. In addition, it provided a quantitative analysis on how implementation affected physician satisfaction, provider continuity, and wait time for appointments. In looking at implementing an open access system from a qualitative standpoint, the open access appointment system just makes sense. The ability to increase access, generate more workload and revenue, and increase clinical outcomes are goals that any medical treatment facility should strive to meet. Commitment of resources will vary from facility to facility based upon current infrastructure and available personnel. Control over the appointment system, clinical templates, and the footprint of the treatment areas are germane to all locations and are the linchpin to success of the program.

While sounding easy in theory, undertaking the transition to an open access system is complex. Proper planning and discussion must be made at all levels of the organization. This planning and discussion must cross

administrative and clinical boundaries in order for the transition to be successful. The main reason that KACH has been able to successfully initiate the transition to open access is that constant communication between the clinical and administrative staff takes place. This allows ideas to be discussed and analyzed prior to commitment of resources, streamlining the process and ensuring that all efforts are placed toward the ultimate goal of providing timely access to high quality healthcare at an affordable cost.

In order to achieve this goal, KACH must be able to meet each of the three corners of the iron triangle of cost, quality, and access. The first area, cost, is not applicable to KACH. Under the current TRICARE system, TRICARE Prime beneficiaries have no cost associated with their care. There is no associated co-pay for primary care visits so the beneficiaries are shielded from any financial burden that healthcare might impose. As such, KACH has no real ability to affect the cost of healthcare to the consumer.

The measurement of quality in healthcare is nebulous at best; however, the healthcare industry often uses the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) survey results as a proxy for

determining if a medical facility provides quality care (Ulmer & Troxler, 2002). Keller Army Community Hospital's JCAHO score of 98 out of a possible 100 (DEC 2004) placed it in the top 10% of all healthcare organizations in the country and emphatically showed its commitment to quality healthcare.

The commitment of KACH to an open access system is the continuation of numerous steps it has made to become the MHS's leader in providing world-class health care for all beneficiaries. With the qualitative and quantitative results indicating that open access has had a positive impact on the organization it is recommended that KACH continue with the phased implementation plan and actively support transitioning to Phase II in September 2004. This will bring the appointing function back under the facility's control and allow for the full implementation of the open access system. It is recommended that follow up studies be conducted to ascertain the full impact of 100% transition to open access at KACH. It is anticipated that future studies will show even greater positive impacts of the system and the continuation of healthcare excellence at Keller Army Community Hospital.

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Appendix A—Provider Satisfaction Survey

Directions for Completing the Physician Satisfaction Survey

(1) Carefully read each question listed below.
(2) Decide how satisfied you are with that particular aspect of your professional situation.
(3) Indicate your answer by circling the number in the corresponding row that best describes how you feel.

Example: Read question number one. If you are "*Always Satisfied*" with "*Your overall professional practice*", then you should **circle** the number "*5*" in the row to the right of question number one.

Please answer all 16 questions and feel free to make comments in the space provided at the end of the survey. All the information on this survey is important and your responses will be kept confidential.

Question Number	How satisfied are you with….	Never Satisfied	Sometimes Satisfied	Usually Satisfied	Satisfied most of the time	Always Satisfied	Not Applicable
1	Your overall professional practice?	1	2	3	4	5	0
2	Your current work setting?	1	2	3	4	5	0
3	Extent to which your current practice has met your expectations?	1	2	3	4	5	0
4	Potential to achieve your professional goals?	1	2	3	4	5	0
5	Quality of care you are able to provide?	1	2	3	4	5	0
6	Your ability to practice according to your best judgment?	1	2	3	4	5	0
7	The efficiency with which you are able to practice in your facility?	1	2	3	4	5	0
8	Amount of time you are able to spend with each patient?	1	2	3	4	5	0
9	The number of patients you see on a typical day?	1	2	3	4	5	0
10	Number of examination rooms available?	1	2	3	4	5	0
11	Continuity of patient care you area able to provide?	1	2	3	4	5	0
12	The non-salary benefits of being a military officer?	1	2	3	4	5	0
13	Amount of time you have for your family and your personal life?	1	2	3	4	5	0
14	Amount of time you are required to be on call?	1	2	3	4	5	0
15	Your ability to help form policies within your facility?	1	2	3	4	5	0
16	Amount of time you spend practicing outside your specialty?	1	2	3	4	5	0

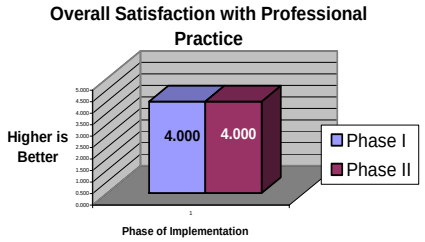
This space has been provided to allow you to make any comments that you feel are pertinent to your satisfaction level

Appendix B Provider Satisfaction Report Card Baseline

Keller Army Community Hospital Physician Satisfaction Survey Pre-Phase I

Overall Satisfaction with Professional Practice (Q1)

Mean Score Reported (5=Always Satisfied, 1= Never Satisfied)

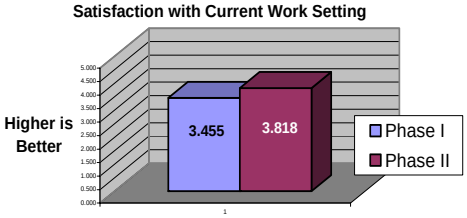


N/A Significantly Different From Pre-Implementation

N/A Not Significantly Different From Pre-Implementation

Overall Satisfaction with Current Work Setting (Q2)

Mean Score Reported (5=Always Satisfied, 1= Never Satisfied)



N/A Significantly Different From Pre-Implementation

N/A Not Significantly Different From Pre-Implementation

Change From Previous Period	Satisfaction Questions from Questionnaire (5=Always Satisfied, 1= Never Satisfied)	Mean Score	*Comparison To:* BaseLine	Phase I
	Quality of Care			
N/A	Quality of care you are able to provide? (Q5)	4.000	———	N/A
N/A	Your ability to practice according to your best judgment? (Q6)	4.182	———	N/A
N/A	The efficiency with which you are able to practice in your facility? (Q7)	3.000	———	N/A
	Global Facets of Healthcare			
N/A	Your overall professional practice? (Q1)	4.000	———	N/A
N/A	Your current work setting? (Q2)	3.455	———	N/A
N/A	Extent to which your current practice has met your expectations? (Q3)	3.727	———	N/A
N/A	Potential to achieve your professional goals? (Q4)	3.818	———	N/A
	Continuity of Practice			
N/A	Amount of time you are able to spend with each patient? (Q8)	3.364	———	N/A
N/A	The number of patients you see on a typical day? (Q9)	3.455	———	N/A
N/A	Number of examination rooms available? (Q10)	3.000	———	N/A
N/A	Continuity of patient care you area able to provide? (Q11)	2.909	———	N/A
	Personal Time			
N/A	Amount of time you have for your family and your personal life? (Q13)	3.364	———	N/A
N/A	Amount of time you are required to be on call? (Q14)	3.364	———	N/A
	Single Item Facets			
N/A	The non-salary benefits of being a military officer? (Q12)	3.364	———	N/A
N/A	Your ability to help form policies within your facility? (Q15)	3.182	———	N/A
N/A	Amount of time you spend practicing outside your specialty? (Q16)	2.909	———	N/A

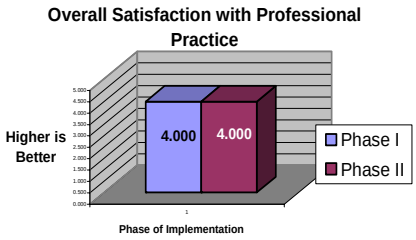
Your Rating is: ↓ Lower ——— Same ↑ Higher

Appendix C Provider Satisfaction Survey Post-Phase I

Keller Army Community Hospital Physician Satisfaction Survey Post-Phase I

Overall Satisfaction with Professional Practice (Q1)

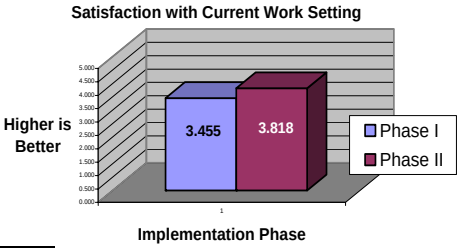
Mean Score Reported (5=Always Satisfied, 1= Never Satisfied)



	Significantly Different From Pre-Implementation
X	Not Significantly Different From Pre-Implementation

Overall Satisfaction with Current Work Setting (Q2)

Mean Score Reported (5=Always Satisfied, 1= Never Satisfied)



N/A	Significantly Different From Pre-Implementation
N/A	Not Significantly Different From Pre-Implementation

Change From Previous Period	Satisfaction Questions from Questionnaire (5=Always Satisfied, 1= Never Satisfied)	Mean Score	*Comparison To:* BaseLine	Phase I
	Quality of Care			
0.273	Quality of care you are able to provide? (Q5)	4.273	↑	N/A
0.273	Your ability to practice according to your best judgment? (Q6)	4.455	↑	N/A
0.364	The efficiency with which you are able to practice in your facility? (Q7)	3.364	↑	N/A
	Global Facets of Healthcare			
0.000	Your overall professional practice? (Q1)	4.000	—	N/A
0.364	Your current work setting? (Q2)	3.818	↑	N/A
0.273	Extent to which your current practice has met your expectations? (Q3)	4.000	↑	N/A
0.000	Potential to achieve your professional goals? (Q4)	3.818	—	N/A
	Continuity of Practice			
0.545	Amount of time you are able to spend with each patient? (Q8)	3.909	↑	N/A
0.000	The number of patients you see on a typical day? (Q9)	3.455	—	N/A
0.000	Number of examination rooms available? (Q10)	3.000	—	N/A
0.455	Continuity of patient care you area able to provide? (Q11)	3.364	↑	N/A
	Personal Time			
0.000	Amount of time you have for your family and your personal life? (Q13)	3.364	—	N/A
0.182	Amount of time you are required to be on call? (Q14)	3.545	↑	N/A
	Single Item Facets			
0.000	The non-salary benefits of being a military officer? (Q12)	3.364	—	N/A
0.000	Your ability to help form policies within your facility? (Q15)	3.182	—	N/A
0.000	Amount of time you spend practicing outside your specialty? (Q16)	2.909	—	N/A

Your Rating is: ↓ Lower — Same ↑ Higher

Appendix D Provider Satisfaction Survey Results

Analysis of Variance (ANOVA)

		Sum of Squares	df	Mean Square	F	Sig.
Q1	Between Groups	.000	1	.000	.000	1.000
	Within Groups	4.000	20	.200		
	Total	4.000	21			
Q2	Between Groups	.727	1	.727	2.286	.146
	Within Groups	6.364	20	.318		
	Total	7.091	21			
Q3	Between Groups	.409	1	.409	.672	.422
	Within Groups	12.182	20	.609		
	Total	12.591	21			
Q4	Between Groups	.000	1	.000	.000	1.000
	Within Groups	15.273	20	.764		
	Total	15.273	21			
Q5	Between Groups	.409	1	.409	.672	.422
	Within Groups	12.182	20	.609		
	Total	12.591	21			
Q6	Between Groups	.409	1	.409	.500	.488
	Within Groups	16.364	20	.818		
	Total	16.773	21			
Q7	Between Groups	.727	1	.727	1.379	.254
	Within Groups	10.545	20	.527		
	Total	11.273	21			
Q8	Between Groups	1.636	1	1.636	1.525	.231
	Within Groups	21.455	20	1.073		
	Total	23.091	21			
Q9	Between Groups	.000	1	.000	.000	1.000
	Within Groups	19.455	20	.973		
	Total	19.455	21			
Q10	Between Groups	.000	1	.000	.000	1.000
	Within Groups	32.000	20	1.600		
	Total	32.000	21			
Q11	Between Groups	1.136	1	1.136	1.471	.239
	Within Groups	15.455	20	.773		
	Total	16.591	21			
Q12	Between Groups	.000	1	.000	.000	1.000
	Within Groups	9.091	20	.455		
	Total	9.091	21			
Q13	Between Groups	.000	1	.000	.000	1.000
	Within Groups	17.091	20	.855		
	Total	17.091	21			
Q14	Between Groups	.182	1	.182	.690	.416
	Within Groups	5.273	20	.264		
	Total	5.455	21			
Q15	Between Groups	.000	1	.000	.000	1.000
	Within Groups	11.273	20	.564		
	Total	11.273	21			
Q16	Between Groups	.000	1	.000	.000	1.000
	Within Groups	9.818	20	.491		
	Total	9.818	21			

Baseline Descriptive Statistics

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std.	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Q1.1	11	2.00	3.00	5.00	4.0000	.13484	.44721	.200
Q2.1	11	1.00	3.00	4.00	3.4545	.15746	.52223	.273
Q3.1	11	3.00	2.00	5.00	3.7273	.27273	.90453	.818
Q4.1	11	2.00	3.00	5.00	3.8182	.26348	.87386	.764
Q5.1	11	3.00	2.00	5.00	4.0000	.26968	.89443	.800
Q6.1	11	3.00	2.00	5.00	4.1818	.32525	1.07872	1.164
Q7.1	11	2.00	2.00	4.00	3.0000	.23355	.77460	.600
Q8.1	11	4.00	1.00	5.00	3.3636	.36364	1.20605	1.455
Q9.1	11	4.00	1.00	5.00	3.4545	.34015	1.12815	1.273
Q10.1	11	4.00	1.00	5.00	3.0000	.38139	1.26491	1.600
Q11.1	11	3.00	1.00	4.00	2.9091	.31492	1.04447	1.091
Q12.1	11	2.00	2.00	4.00	3.3636	.20328	.67420	.455
Q13.1	11	3.00	2.00	5.00	3.3636	.27872	.92442	.855
Q14.1	11	1.00	3.00	4.00	3.3636	.15212	.50452	.255
Q15.1	11	2.00	2.00	4.00	3.1818	.22636	.75076	.564
Q16.1	11	3.00	1.00	4.00	2.9091	.21125	.70065	.491
Valid N (listwis	11							

Phase I Descriptive Statistics

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std.	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Q1.1	11	2.00	3.00	5.00	4.0000	.13484	.44721	.200
Q2.1	11	2.00	3.00	5.00	3.8182	.18182	.60302	.364
Q3.1	11	2.00	3.00	5.00	4.0000	.19069	.63246	.400
Q4.1	11	2.00	3.00	5.00	3.8182	.26348	.87386	.764
Q5.1	11	2.00	3.00	5.00	4.2727	.19498	.64667	.418
Q6.1	11	2.00	3.00	5.00	4.4545	.20730	.68755	.473
Q7.1	11	2.00	2.00	4.00	3.3636	.20328	.67420	.455
Q8.1	11	2.00	3.00	5.00	3.9091	.25062	.83121	.691
Q9.1	11	2.00	2.00	4.00	3.4545	.24730	.82020	.673
Q10.1	11	4.00	1.00	5.00	3.0000	.38139	1.26491	1.600
Q11.1	11	2.00	2.00	4.00	3.3636	.20328	.67420	.455
Q12.1	11	2.00	2.00	4.00	3.3636	.20328	.67420	.455
Q13.1	11	3.00	2.00	5.00	3.3636	.27872	.92442	.855
Q14.1	11	1.00	3.00	4.00	3.5455	.15746	.52223	.273
Q15.1	11	2.00	2.00	4.00	3.1818	.22636	.75076	.564
Q16.1	11	3.00	1.00	4.00	2.9091	.21125	.70065	.491
Valid N (listwise)	11							

Total Response Dataset

Respondent	Global Healthcare Facets				Quality of Care Delivered			Continuity of Practice			SI	Personal Time	
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
1	4	4	3	4	4	5	2	3	3	2	3	2	2	3
2	4	3	4	4	5	5	3	5	4	2	4	4	3	3
3	4	4	4	4	4	4	3	2	2	3	3	3	4	3
4	4	3	5	5	5	5	4	3	4	5	3	3	4	3
5	5	4	5	3	5	5	4	3	4	5	4	3	5	3
6	4	3	2	3	2	3	2	1	1	1	1	3	3	4
7	4	3	4	3	4	5	2	3	3	3	4	3	4	3
8	4	4	4	3	4	4	4	4	4	4	4	4	4	4
9	4	3	3	3	4	5	3	4	5	3	2	4	3	4
10	4	3	4	5	3	3	3	4	4	3	2	4	3	3
11	3	4	3	5	4	2	3	5	4	2	2	4	2	4
N	11	11	11	11	11	11	11	11	11	11	11	11	11	11
MIN	3	3	2	3	2	2	2	1	1	1	1	2	2	3
MAX	5	4	5	5	5	5	4	5	5	5	4	4	5	4
Mean	4.000	3.455	3.727	3.818	4.000	4.182	3.000	3.364	3.455	3.000	2.909	3.364	3.364	3.364
S.D.	0.447	0.522	0.905	0.874	0.894	1.079	0.775	1.206	1.128	1.265	1.044	0.674	0.924	0.505

Respondent	Global Healthcare Facets				Quality of Care Delivered			Continuity of Practice			SI	Personal Time	
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
1	4	5	3	4	4	5	3	4	3	2	4	2	2	3
2	4	3	4	4	5	5	3	5	4	2	4	4	3	4
3	4	4	4	4	4	4	3	3	2	3	3	3	4	3
4	4	4	5	5	5	5	4	3	4	5	3	3	4	4
5	5	4	5	3	5	5	4	4	4	5	4	3	5	3
6	4	3	4	3	4	4	3	3	2	1	3	3	3	4
7	4	4	4	3	4	5	2	3	3	3	4	3	4	3
8	4	4	4	3	5	4	4	4	4	4	4	4	4	4
9	4	3	3	3	4	5	4	5	4	3	3	4	3	4
10	4	4	4	5	3	3	4	4	4	3	3	4	3	3
11	3	4	4	5	4	4	3	5	4	2	2	4	2	4
N	11	11	11	11	11	11	11	11	11	11	11	11	11	11
MIN	3	3	3	3	3	3	2	3	2	1	2	2	2	3
MAX	5	5	5	5	5	5	4	5	4	5	4	4	5	4
Mean	4.000	3.818	4.000	3.818	4.273	4.455	3.364	3.909	3.455	3.000	3.364	3.364	3.364	3.545
S.D.	0.447	0.603	0.632	0.874	0.647	0.688	0.674	0.831	0.820	1.265	0.674	0.674	0.924	0.522

Appendix E Written Comments

My lack of satisfaction is derived from having too much responsibility without any control over monetary or personnel choices.

More time is needed in the day to follow up with patients and actively manage their care.

More time is needed to effectively manage the care of our patients. Are we operating under a managed care system or not?

Why can’t KACH optimize the primary care department? Every other department is getting renovated, why can’t we.

Too much focus on non-essential “training” takes away from good patient care. No focus on continuity.

I wish there was one standard for automation. Learning a new system every year is getting old.

More support staff is needed to maximize efficiency.

What department does the Commander support? Certainly not family practice.

I wish I had more time to spend with patients and less administrative functions to attend.

Appendix F Provider Continuity Results

Continuity Descriptive Statistics

Descriptives

Continuity Percentage

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
						Lower Bound	Upper Bound			
0		143	.525608	.1684409	.0140857	.497764	.553453	.0000	1.0000	
1		55	.652236	.1388148	.0187178	.614709	.689763	.4740	1.0000	
Total		198	.560783	.1701949	.0120952	.536930	.584636	.0000	1.0000	
Model	Fixed Effects			.1608242	.0114293	.538243	.583323			
	Random Effects				.0688200	-.313658	1.435223			.0076918

Analysis of Variance Results

Continuity Percentage

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.637	1	.637	24.626	.000
Within Groups	5.069	196	.026		
Total	5.706	197			

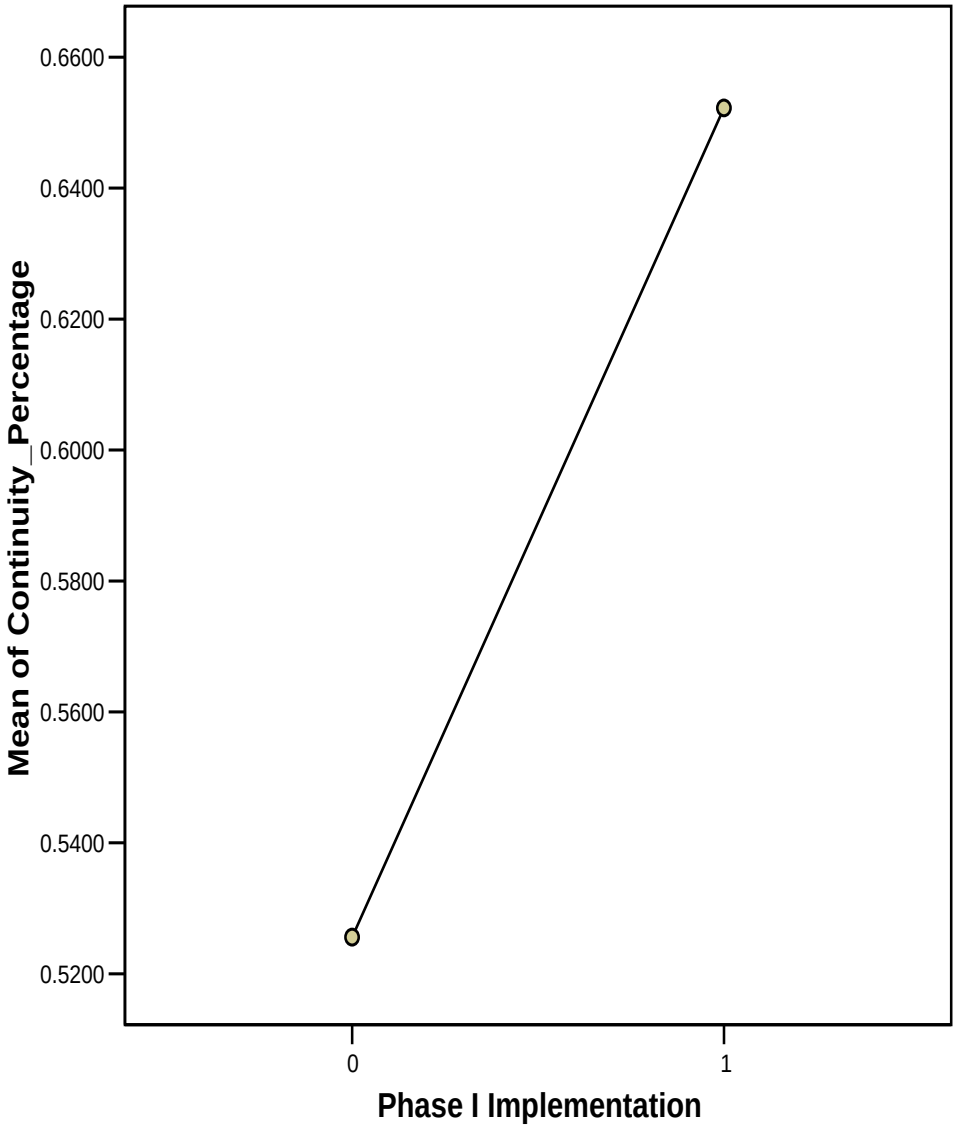
Pearson Correlation

Correlations

		Continuity Percentage	Phase I Implementation
Continuity Percentage	Pearson Correlation	1	.334(**)
	Sig. (2-tailed)	.	.000
	Sum of Squares and Cross-products	5.706	5.030
	Covariance	.029	.026
	N	198	198
Phase I Implementation	Pearson Correlation	.334(**)	1
	Sig. (2-tailed)	.000	.
	Sum of Squares and Cross-products	5.030	39.722
	Covariance	.026	.202
	N	198	198

** Correlation is significant at the 0.01 level (2-tailed).

Means Plots


0.6600
0.6400
0.6200
0.6000
0.5800
0.5600
0.5400
0.5200
Mean of Continuity_Percentage
0
1
Phase I Implementation

Appendix G Appointment Wait Time Results

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Third_Avail	60	2.50	5.10	3.4983	.52124	.272
Appt_OA	60	.00	1.00	.3333	.47538	.226
Valid N (listwise)	60					

Analysis of Variance Results

Third_Avail

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.524	1	4.524	22.806	.000
Within Groups	11.506	58	.198		
Total	16.030	59			

Pearson Correlation

		Third_Avail	Appt_OA
Third_Avail	Pearson Correlation	1	-.531(**)
	Sig. (2-tailed)	.	.000
	Sum of Squares and Cross-products	16.030	-7.767
	Covariance	.272	-.132
	N	60	60
Appt_OA	Pearson Correlation	-.531(**)	1
	Sig. (2-tailed)	.000	.
	Sum of Squares and Cross-products	-7.767	13.333
	Covariance	-.132	.226
	N	60	60

** Correlation is significant at the 0.01 level (2-tailed).

Means Plots